

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Andrew T. Sultenfuss et al.  
Serial No.: 10/679,130  
Date Filed: October 3, 2003  
Group Art Unit: 2467  
Confirmation No. 2208  
Examiner: Berhane, Yosief H.  
Title: **SYSTEM, METHOD & DEVICE FOR  
TUNING A SWITCHED TRANSMISSION  
LINE FOR ETHERNET LOCAL AREA  
NETWORK-ON-MOTHERBOARD (LOM)**

**MAIL STOP – AMENDMENT**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**DECLARATION OF ANDREW T. SULTENFUSS SUBMITTED**  
**PURSUANT TO 37 C.F.R. § 1.131**

I, the undersigned joint inventor, hereby declare and state that:

1. I am over the age of 21 years, of sound mind, and competent in all respects to make this Declaration.
2. I am a co-inventor of the subject matter claimed in the above-identified patent application entitled "*System, Method & Device for Tuning a Switched Transmission Line for Ethernet Local Area Network-On-Motherboard (LOM)*" filed on October 3, 2003 (hereinafter the "Application").

3. The Examiner rejected Claims 1-15 and 19-20 as being unpatentable over U.S. Patent Publication 2003/0224801 by Lovberg et al. ("*Lovberg*") as well as U.S. Patent 6,226,292 by Diplacido ("*Diplacido*") and U.S. Patent 6,393,109 by Willer ("*Willer*").

4. I have reviewed and understand Claims 1-15 and 19-20 as contained in the response to the Office Action dated June 25, 2010.

5. I am familiar with the circumstances of the conception and reduction to practice of the subject matter claimed in the Application.

6. The present invention was conceived and/or reduced to practice on or prior to December 12, 2002, the filing date of *Lovberg*.

7. Prior to December 12, 2002, which is the filing date of the *Lovberg* reference identified above in paragraph 3, I and the other named inventor conceived of the present invention. The invention was first conceived on August 12, 2002, as described in detail in my engineering notebook at page 57 and attached hereto as Exhibit A. The subject matter of the claimed invention is further described in a redacted Dell Invention Disclosure Form, attached hereto as Exhibit B. The disclosure form was duly submitted to Dell legal personnel on February 28, 2003, as described on Page 1 of the form. These events were all in accordance with the standard procedure in place at Dell Inc. for the submission of invention disclosures and independent verification thereof by at least one witness.


8. In the period from December 12, 2002 to October 3, 2003, when the Application was filed, I along with my co-inventor and Attorneys for Applicants worked diligently to complete and file the Application. In particular, during this period, I reviewed the draft patent applications sent on September 12, 2003 and September 22, 2003 to confirm that they accurately and adequately described the invention. Attorneys for Applicants edited the draft patent applications based at least on the results of my review, communicated with the other named inventor to finalize the draft patent application, and prepared the application for filing with the U.S. Patent Office. Various emails evidencing such activities to prepare and file the Patent Application are attached hereto as Exhibit C.

ATTORNEY DOCKET  
016295.1436

PATENT APPLICATION  
10/679,130

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title of the United States Code and that such willful statements may jeopardize the validity of any patent issuing from the above-identified application.

Date: 10/13/2010

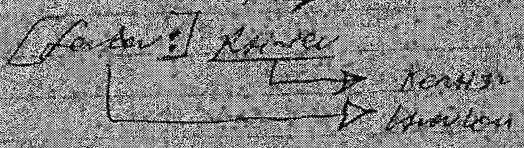
  
Andrew T. Sultenfuss

## **EXHIBIT A**

08/12/2002

Total 10 MG ket. Surge bed effect

& Seep surge to 1000 (1000 bed)



100 → 10

gait/1000 →

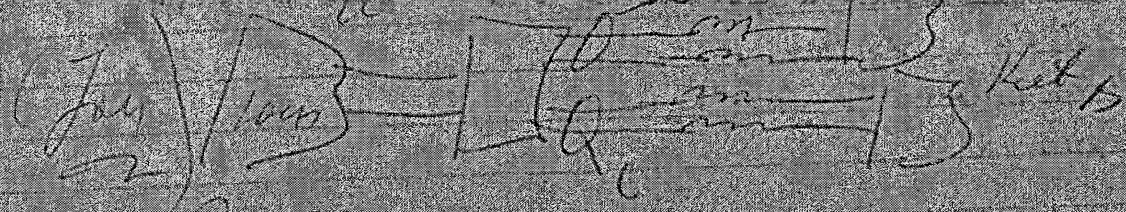
100 → 10 g ARP - gait 1000  
#1 #2

[10000 MG Kerker] Gait 1000 [Kerker 10000]

+ 9255762 - Neck Photo Test

09/15/2002

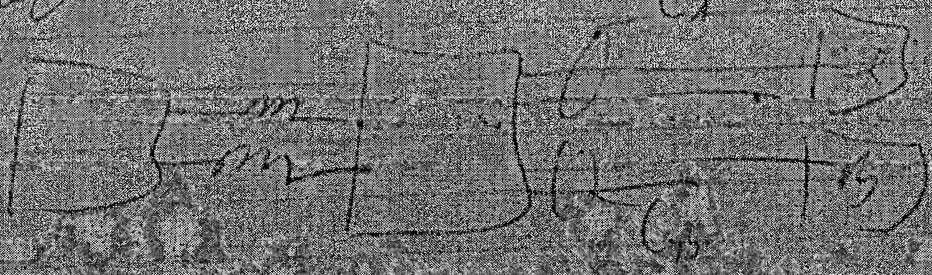
Effect of 1000 on Cal Thp. Ket A



Car

10000

Effect of 1000 on Cal Thp. Ket B



Effect of 1000 on Cal Thp. Ket C

## **EXHIBIT B**

DC-05224

Title:  
**IMPEDANCE MATCHING A SWITCHED TRANSMISSION LINE FOR ETHERNET LOM.**

**INVENTORS**

Andrew T Sultenfuss (Dell),

Jonathan Lewis (Dell),

**RELEVANT DATES & DISCLOSURES**

Submission Date:

2/28/2003

Conception Date:

8/12/2002

Invention first described in:

Sultenfuss Eng Notebook Page 57 Volume 2, 2002  
and Jon Lewis Engineering Notebook 1 Page 5

**TECHNOLOGY**

Product Line:

Portables

Project Code Name(s):

Bondi

Relevant Standards:

IEEE 802.3ab

**WITNESSES**



Witness 1:  
Witness 2:

Christian Critz  
Vipul Patel

## THE PROBLEM

Impedance matching a switched transmission line for Ethernet LOM.

IEEE 802.3ab 40.8.3.1 specifies return loss across the frequency range of Gigabit Ethernet. Adding an analog mux to switch the Ethernet port from one physical port to another port disturbs the matched transmission line and causes return loss failures.

Current gigabit Ethernet part manufacturers do not consider matched differential impedance in their designs and ignore return loss ramifications.

Parasitic capacitance builds up and becomes a significant issue to meet IEEE while using an Eswitch device for Port control.

Enterprise notebook users rely on Docking and Non-Docking LOM applications for ease-of-use. Eliminating a dual LOM solution requires switching a single LOM device to two physically separate ports. This issue will effect Docks and Notebooks well into the future.

## PRIOR SOLUTIONS/EXISTING TECHNOLOGY

10/100/1000 Ethernet switches are derivations of historical 10/100 solutions. These do not take into account the requirements for Return Loss to match the IEEE specifications.

10/100 Eswitches can and do meet the spec with tight control of board parameters and the relaxed specifications for 10/100.

Return Loss is a measure of impedance matching. Current reference designs from these manufacturers ignore return loss failures and rely on Bit Error Rate for system reliability. This violates IEEE 802.3ab and by definition makes them not compliant to IEEE.

Competitive docking solutions typically violate IEEE 802.3 in both isolation and return loss. Enterprise users expect systems to fully comply with IEEE 802.3.

## PROPOSED SOLUTIONS

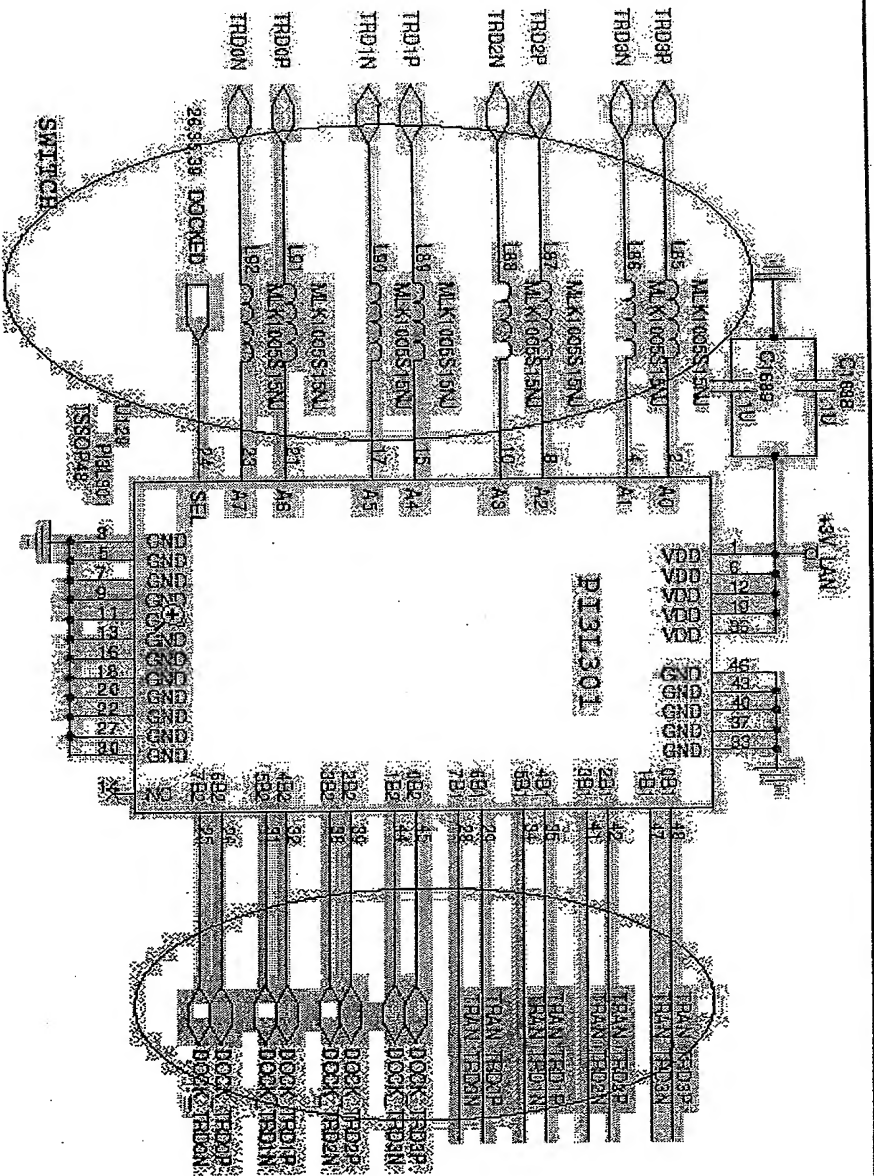
By tuning the transfer function of the combined transmission line/Ethernet switch we can balance the transmission line.

With the use of series inductance, we compensate for the mismatched Ethernet switch and transmission line effects.

By implementing this solution we allow the system to comply with both isolation and return loss requirements as specified by IEEE 802.3.

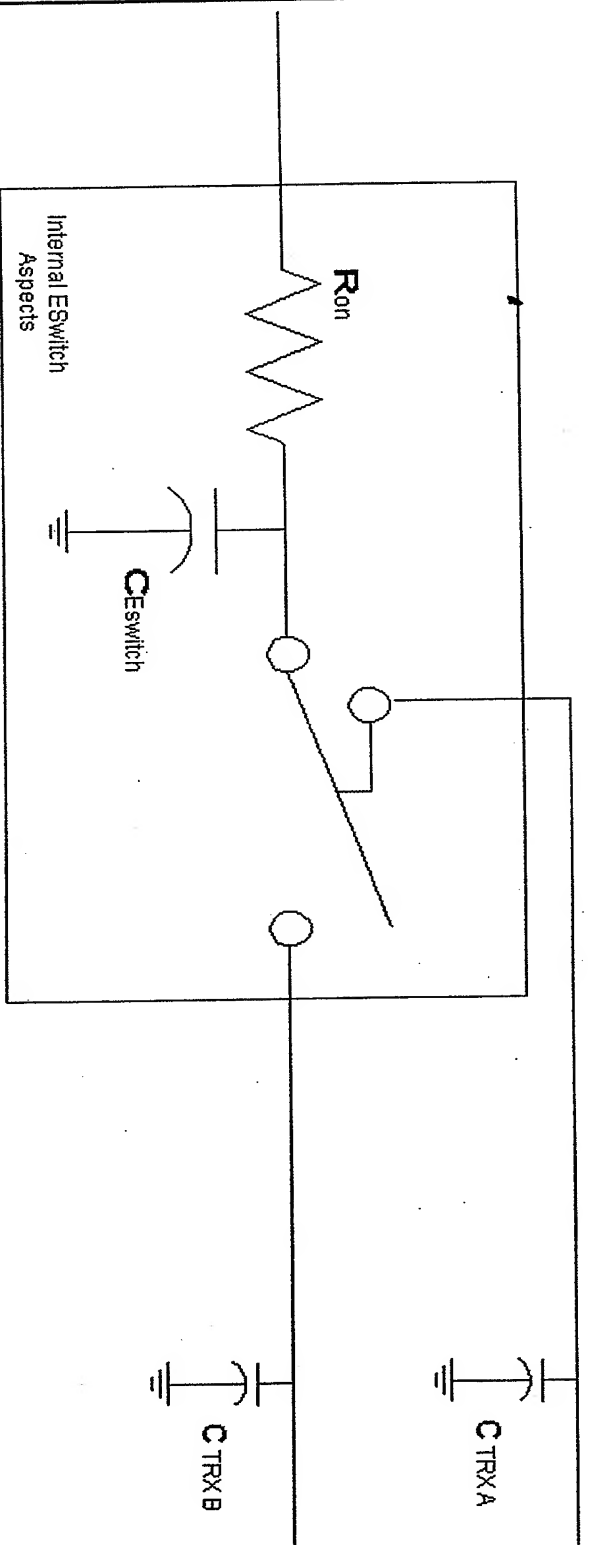


# FIGURES



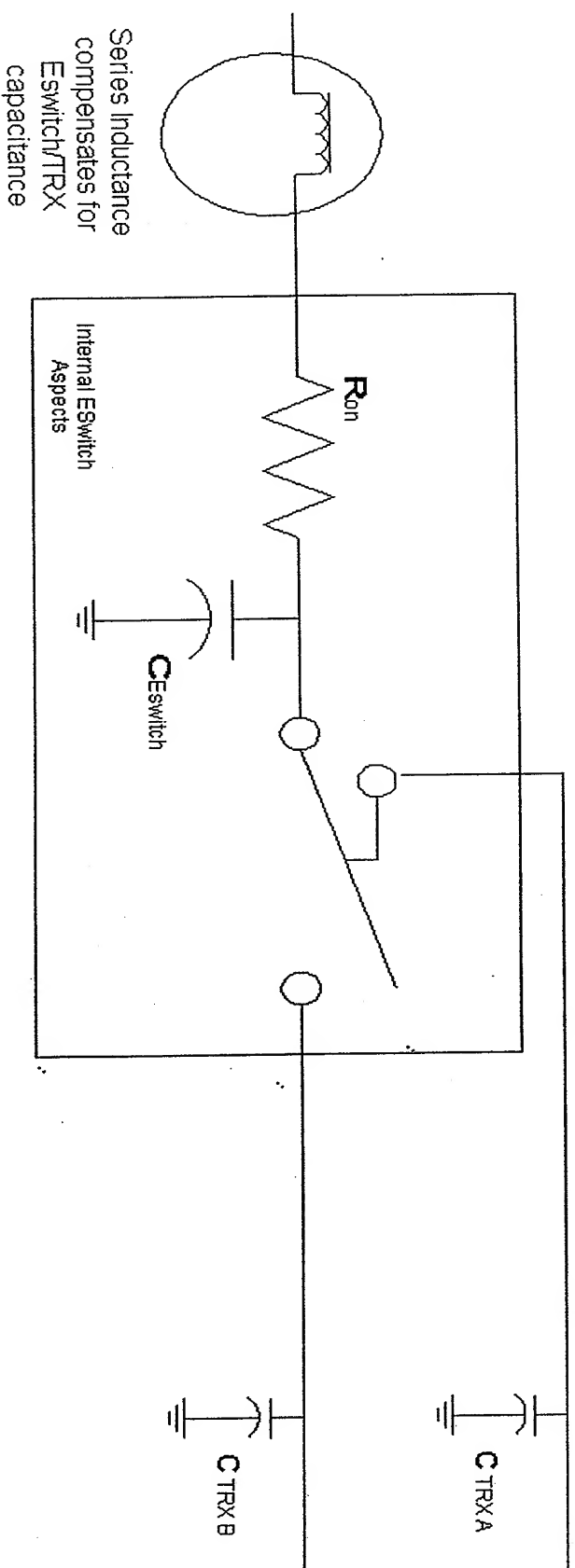
# Basic Eswitch Transmission Line Elements

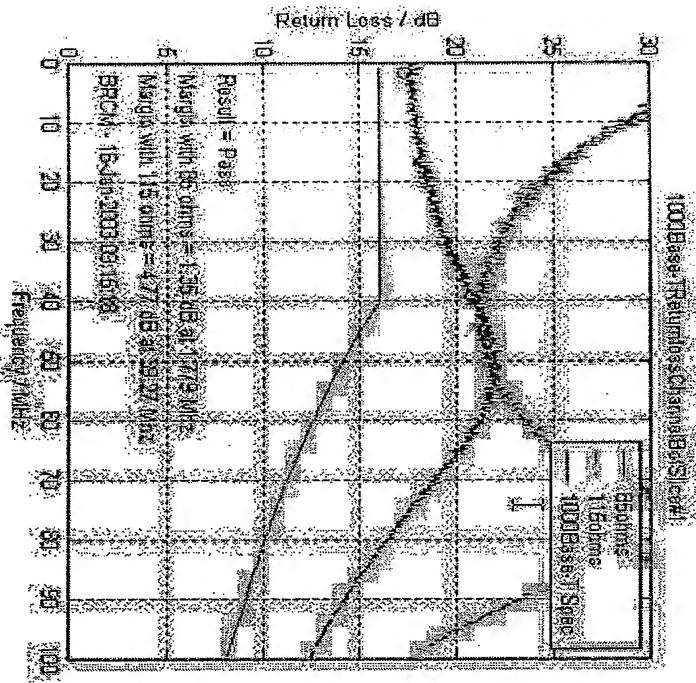
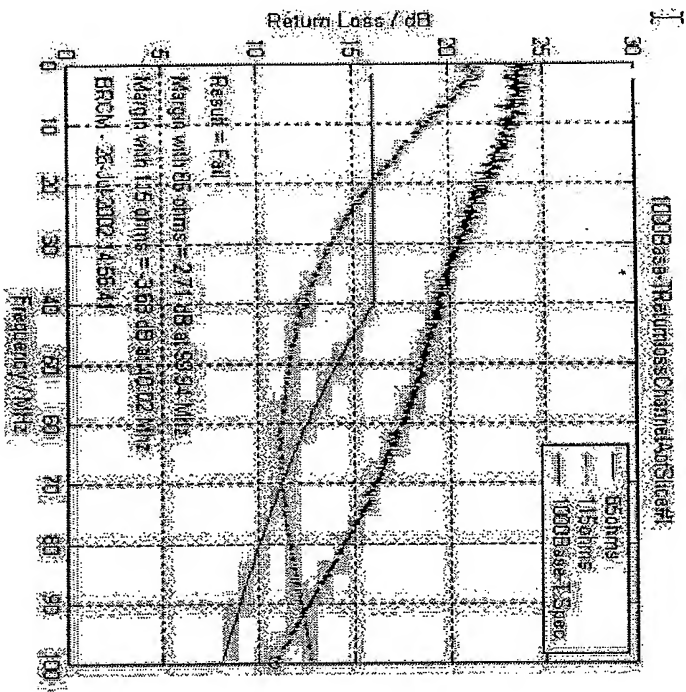
A. Sultenfuss 02/28/2003



# Compensated Eswitch Transmission Line Elements

A. Sultenfuss 02/28/2003





## **EXHIBIT C**

## Chelette, Brandi

---

**From:** Chelette, Brandi  
**Sent:** Friday, September 19, 2003 4:36 PM  
**To:** 'andy\_sultenfuss@dell.com'; 'jon\_lewis@dell.com'  
**Cc:** Dietzel, Brian  
**Subject:** DC-05224 First Draft Patent Application

Dear Inventors:

This is a follow-up to the email we sent on September 12, 2003 (attached for your quick reference). If the application meets with the approval of both of you, we would like to move forward with this application and send formal documents for your signature. Please let us know your thoughts at your earliest convenience.

Thank you very much,

**Brandi Chelette**  
Intellectual Property Legal Secretary  
Baker Botts L.L.P.  
512.322.2519 - Austin, Texas  
brandi.chelette@bakerbotts.com

-----Original Message-----

**From:** Chelette, Brandi  
**Sent:** Friday, September 12, 2003 5:32 PM  
**To:** 'andy\_sultenfuss@dell.com'; 'jon\_lewis@dell.com'  
**Cc:** Dietzel, Brian  
**Subject:** DC-05224 First Draft Patent Application

Re: U.S. Patent Application Entitled "***System, Method & Device for Tuning a Switched Transmission Line for Ethernet Local Area Network-on-Motherboard (LOM)***"  
Your File: DC-05224  
Our File: 016295.1436

Dear Inventors:

Brian Dietzel requested that I forward the attached letter, draft patent and draft drawings for the above-referenced matter. The projected filing date for this application was September 11, 2003. We apologize for the delay in getting this application out to you. We hope to file this application as soon as possible. Please review the attached and return your comments to us at your earliest convenience. If you have any questions or comments, please contact Brian Dietzel at 512.322.2674.



First Draft Letter  
DC-05224.pd...



Draft Patent  
DC-04995.doc



Drawings DC-05224  
pdf.pdf

Thank you very much,

**Brandi Chelette**  
Intellectual Property Legal Secretary  
Baker Botts L.L.P.  
1500 San Jacinto Center  
98 San Jacinto Blvd.  
Austin, Texas 78701-4039  
512.322.2519  
FAX 512.322.2501

## Chelette, Brandi

---

**From:** Chelette, Brandi  
**Sent:** Monday, September 22, 2003 3:54 PM  
**To:** 'andy\_sultenfuss@dell.com'; 'jon\_lewis@dell.com'  
**Cc:** Dietzel, Brian  
**Subject:** DC-05224 Second Draft Patent Application

Re: U.S. Patent Application Entitled ***"System, Method & Device for Tuning a Switched Transmission Line for Ethernet Local Area Network-On-Motherboard (LOM)"***  
Your File: DC-05224  
Our File: 016295.1436

Inventors:

Please find attached a second draft of the above-referenced patent application from Brian Dietzel for your review and comment. Please note that your requested changes have been incorporated into this application. A copy of the draft drawings is also attached.

Upon approval of application, formal papers will follow for your signature.

If you have any questions or comments, please contact Brian Dietzel at 512.322.2674.



Draft Patent  
DC-05224.doc



Drawings  
DC-05224.pdf

Thank you very much,

**Brandi Chelette**  
Intellectual Property Legal Secretary  
Baker Botts L.L.P.  
1500 San Jacinto Center  
98 San Jacinto Blvd.  
Austin, Texas 78701-4039  
512.322.2519  
FAX 512.322.2501  
brandi.chelette@bakerbotts.com

\*\*\*\* PRIVILEGED AND CONFIDENTIAL \*\*\*\*

NOTICE: This e-mail transmission, and any documents, files or previous e-mail messages attached to it may contain confidential information that is legally privileged and intended only for the use of the addressee. The term 'privileged and confidential' includes, without limitation, attorney-client privileged communications, attorney work product, trade secrets, and any other proprietary information. In transmitting this communication, the sender does not waive any claim to privilege or confidentiality. If you are not the intended recipient, or a person responsible for delivering it to the intended recipient, you are hereby notified that any disclosure, copying, distribution or use of any of the information contained in or attached to this transmission is STRICTLY PROHIBITED. If you have received this transmission in error, please immediately notify us by reply e-mail or by telephone at 512.322.2500 and destroy the original transmission and its attachments without reading or saving in any manner.



## Chelette, Brandi

---

**From:** Chelette, Brandi  
**Sent:** Tuesday, September 23, 2003 1:50 PM  
**To:** 'andy\_sultenfuss@dell.com'; 'jon\_lewis@dell.com'  
**Cc:** Dietzel, Brian  
**Subject:** DC-05224 Draft Patent

**Re:** U.S. Patent Application Entitled "***System, Method & Device for Tuning a Switched Transmission Line for Ethernet Local Area Network-On-Motherboard (LOM)***"  
Your File: DC-05224  
Our File: 016295.1436

Dear Inventors:

Please find attached the revised draft drawings for the above-referenced application. If the drawings meet with the approval of both of you, we would like to move forward with this application and send formal documents for your signature. Please let us know your thoughts at your earliest convenience.



Drawings  
DC-05224.pdf

Thank you very much,

**Brandi Chelette**  
Intellectual Property Legal Secretary  
Baker Botts L.L.P.  
1500 San Jacinto Center  
98 San Jacinto Blvd.  
Austin, Texas 78701-4039  
512.322.2519  
FAX 512.322.2501  
brandi.chelette@bakerbotts.com

\*\*\*\* PRIVILEGED AND CONFIDENTIAL \*\*\*\*

NOTICE: This e-mail transmission, and any documents, files or previous e-mail messages attached to it may contain confidential information that is legally privileged and intended only for the use of the addressee. The term 'privileged and confidential' includes, without limitation, attorney-client privileged communications, attorney work product, trade secrets, and any other proprietary information. In transmitting this communication, the sender does not waive any claim to privilege or confidentiality. If you are not the intended recipient, or a person responsible for delivering it to the intended recipient, you are hereby notified that any disclosure, copying, distribution or use of any of the information contained in or attached to this transmission is STRICTLY PROHIBITED. If you have received this transmission in error, please immediately notify us by reply e-mail or by telephone at 512.322.2500 and destroy the original transmission and its attachments without reading or saving in any manner.

## Thornhill, Kerry

---

**From:** Thornhill, Kerry  
**Sent:** Tuesday, September 30, 2003 12:14 PM  
**To:** 'andy\_sultenfuss@dell.com'; 'jon\_lewis@dell.com'  
**Cc:** Dietzel, Brian  
**Subject:** (DC-05224) (016295.1436) U.S. Patent Application entitled System, Method & Device for tuning a Switched Transmission Line for Ethernet Local Area Network-on-Motherboard (LOM)

Brian Dietzel has requested that I forward you the attached letter (1st icon); final application (2nd icon); Declaration/Power of Attorney (3rd icon); Assignment (4th icon) and drawings (5th icon) for your review and execution. After your review, and if the application and drawings look satisfactory, please execute the Declaration and Assignment and fax the documents to Brian Dietzel's attention at 512.322.8307.



DC - 05224 Letter  
with instruc...



DC-05224 Patent -  
PA System, M...



DC-05224  
Declaration.doc



DC-05224  
Assignment.doc



Drawings for  
DC-05224.pdf

### **Kerry Thornhill**

Intellectual Property Legal Secretary  
Baker Botts L.L.P.  
1500 San Jacinto Center  
98 San Jacinto Boulevard  
Austin, TX 78701-4039

\*\*\* Privileged & Confidential \*\*\*

This message (including any attachments) constitutes a privileged communication and/or contains confidential information intended for a specific individual and purpose, and is protected by law.

If you are not the intended recipient, you should delete this message and are hereby notified that any disclosure, copying, or distribution of this message, or the taking of any action based on it, is strictly prohibited.